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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/407,184	09/27/1999	FARSHAD KHORRAMI	457020-2250.	2412
20999	7590	06/03/2005	EXAMINER	
FROMMER LAWRENCE & HAUG 745 FIFTH AVENUE- 10TH FL. NEW YORK, NY 10151			CONTEE, JOY KIMBERLY	
			ART UNIT	PAPER NUMBER
			2686	

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/407,184	KHORRAMI ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Joy K Contee	2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 29 December 2004.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 13,19,25,26,28-37,40-43 and 49-58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 13,19,25,26,28-37,40-43 and 49-58 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Allowable Subject Matter***

1. The indicated allowability of claims 37,40,41 and 49 is withdrawn in view of the newly discovered references to Pett et al. and Schalk. Rejections based on the newly cited references follow.
2. The indicated allowability of claims 42,43 and 50 is withdrawn because these dependent claims were previously indicated allowable in error, as they are dependents to claims that were previously rejected. Rejections based on these dependent claims follow.

***Response to Arguments***

3. Applicant's arguments filed 12/29/2004 have been fully considered but they are not persuasive.

After reconsidering the reference to Spillman, Jr., Examiner contends that the portion of Spillman, Jr. cited (see col. 4,lines 12-19, wherein an alternative is described using passive electronics) in the last office action with respect to dependent claim 33 meets "wherein at least one of said number of sensors and said number of actuators includes only passive electronic devices" and further meets the amended claim language to independent claims 13,25,28 and newly added claim 53 which suggests "without the use of any active electronic devices".

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 13,25,26, 28-36, 42,43 and 50-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spillman, Jr. U.S. Patent No. 5,440,300, previously used, in view of Edwards et al. (Edwards), U.S. Patent No. 4,684,929, previously used.

Regarding claims 13,25 and 53 Spillman, Jr. discloses a wireless communication system comprising:

a number of actuators (and devices each including at least one of a sensor and an actuator, and/or sensor) each having one or more antenna associated therewith and being adaptable to be located on or within an element, each sensor being adaptable to detect at least one respective predetermined characteristic (e.g., stress, strain or vibration, cracks or separation) of said element) each having one or more antenna associated therewith and being adaptable to be located on or within an element and being adaptable for causing said element to deform in a desired manner when actuated (col. 2,line 15 to col. 3, line 11); and

control transceiver means (i.e., RF coupling 68 in Fig. 9C), operable to communicate in a wireless manner with said number of actuators (and sensors), for supplying a modulated command signal, material characteristics of the respective actuator or actuators cause said modulated command signal to be demodulated and

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said element to achieve the desired deformation (i.e., reads on expansion and contraction) (and RF signal to at least one antenna)(col. 2,line 52 to col. 3, line 41 and col. 4, lines 27-37 and col. 5, lines 7-16);

whereby, in response to said modulated command signal, (an RF signal, the respective sensor or sensors and the at least one antenna associated therewith generate by use of electromagnetic coupling there between a characteristic signal indicative of a detected respective characteristic or characteristics and modulate the same so as to obtain an output signal and transmit said output signal) material characteristics of the respective actuator or actuators cause said modulated command signal to be demodulated without the use of any active electronic devices (reads on alternative wherein passive electronics are used), whereupon said element is enabled to achieve the desired deformation (col. 2, line 40 to col. 3, line 11 and col. 4,lines 12-26).

Spillman,Jr. fails to explicitly disclose wherein said control transceiver means communicates with each said actuator or actuators ( and sensor) over a microwave frequency range.

In a similar field of endeavor, Edwards provides evidence wherein said control transceiver (i.e., transmitter 4, see Fig. 1) means communicates with each said actuator (reads on reflector) sensor (i.e., reads on reflector 8) over a microwave frequency range (col. 4, lines 3-13).

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Spillman, Jr. to include antennae using microwave frequency

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ranges since it is known in the art that communication systems using the highly directive microwave frequencies are seemingly superior to other types of systems in that the properties of microwaves are similar to the properties of light waves.

Regarding claims 19, 26 and 28, Spillman, Jr. discloses a wireless communication system according to claims 13 and 25, respectively. Spillman, Jr. fails to explicitly disclose wherein each said antenna is a micro-strip type antenna.

In a similar field of endeavor, Edwards discloses wherein each said antenna (i.e., reads on phased array of antennae) is a micro-strip type antenna (col. 4, lines 18-27).

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Spillman, Jr. to include use of micro-strip type antennae since it is known that it is typically less expensive to use micro-strip antennae, as taught in Edwards (col. 4, line 18-20).

Regarding claim 29, Spillman, Jr. discloses a system as modified by Edwards as in claim 28, wherein said control means includes transceiver means for communicating in a wireless manner with each sensor and actuator.

Regarding claims 30,51,52 and 58, Spillman, Jr. as modified by Edwards as in claims 13,25,29 and 53,respectively, discloses wherein said transceiver means communicates with each sensor and said actuator over a microwave frequency range (see Edwards, col. 4,lines 3-13).

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Spillman, Jr. to include antennae using microwave frequency ranges since it is known in the art that communication systems using the highly directive

microwave frequencies are seemingly superior to other types of systems in that the properties of microwaves are similar to the properties of light waves.

Regarding claim 31, Spillman, Jr. as modified by Edwards as in claim 28, discloses wherein the processing means is located on or within structure (see Spillman, Jr., col. 1, lines 33-44).

Regarding claim 32, Spillman, Jr. as modified by Edwards as in claim 28, wherein the processing means is not located on or within said structure and wherein said processing means transmits each said processed signal to the appropriate one or ones of the actuators in a wireless manner (see Spillman, Jr. , col. 4,lines 65-68).

Regarding claims 33 and 54, Spillman, Jr. as modified by Edwards as in claims 28 and 53, respectively, discloses wherein at least one of said number of sensors and said number of actuators includes only passive electronic devices (see Spillman, Jr., col. 4,lines 12-19).

Regarding claims 34 and 55, Spillman, Jr. as modified by Edwards as in claims 28 and 53, respectively, discloses wherein at least one of said number of sensors and said number of actuators includes a substrate portion inherently having non-linear material characteristics (see Spillman, Jr., col. 2,lines 52-64).

Regarding claims 34 and 56, Spillman, Jr. as modified by Edwards as in claims 34 and 55, respectively, wherein said substrate portion is a piezoelectric ceramic material (see Spillman, Jr. col. 5,lines 22-25).

Regarding claims 36 and 57, Spillman, Jr. as modified by Edwards as in claims 28 and 53, respectively, wherein the at least one predetermined characteristics includes

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at least one of strain, acceleration, deformation and pressure (see Spillman, Jr., col. 5, lines 22-51).

Regarding claims 42 and 43, Spillman, Jr as modified by Edwards discloses claims 26 and 28, respectively, Spillman,Jr. further inherently discloses having a protective cover layer (structure) and a substrate having a slot and feedline (feed for antenna) (col. 2,line 15- col.3,line 11).

6. Claims 37,40 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Spillman, Jr. and Edwards, in view of Schalk, U.S.Patent No. 5,975,102 and Pett et al. (Pett), U.S. Patent No. 5,210,542.

Regarding claims 37 and 49, Spillman, Jr. discloses a wireless communication system comprising:

a number of actuators (and devices each including at least one of a sensor and an actuator, and/or sensor) each having one or more antenna associated therewith and being adaptable to be located on or within an element, each sensor being adaptable to detect at least one respective predetermined characteristic (e.g., stress, strain or vibration, cracks or separation) of said element) each having one or more antenna associated therewith and being adaptable to be located on or within an element and being adaptable for causing said element to deform in a desired manner when actuated (col. 2,line 15 to col. 3, line 11); and

control transceiver means (i.e., RF coupling 68 in Fig. 9C), operable to communicate in a wireless manner with said number of actuators (and sensors), for supplying a modulated command signal, material characteristics of the respective

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actuator or actuators cause said modulated command signal to be demodulated and said element to achieve the desired deformation (i.e., reads on expansion and contraction) (and RF signal to at least one antenna)(col. 2,line 52 to col. 3, line 41 and col. 4, lines 27-37 and col. 5, lines 7-16);

whereby, in response to said modulated command signal, (an RF signal, the respective sensor or sensors and the at least one antenna associated therewith generate by use of electromagnetic coupling there between a characteristic signal indicative of a detected respective characteristic or characteristics and modulate the same so as to obtain an output signal and transmit said output signal) material characteristics of the respective actuator or actuators cause said modulated command signal to be demodulated without the use of any active electronic devices (reads on alternative wherein passive electronics are used), whereupon said element is enabled to achieve the desired deformation (col. 2, line 40 to col. 3, line 11 and col. 4,lines 12-26).

Spillman,Jr. fails to explicitly disclose wherein said control transceiver means communicates with each said actuator or actuators ( and sensor) over a microwave frequency range.

In a similar field of endeavor, Edwards provides evidence wherein said control transceiver (i.e., transmitter 4, see Fig. 1) means communicates with each said actuator (reads on reflector) sensor (i.e., reads on reflector 8) over a microwave frequency range (col. 4, lines 3-13).

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Spillman, Jr. to include antennae using microwave frequency ranges since it is known in the art that communication systems using the highly directive microwave frequencies are seemingly superior to other types of systems in that the properties of microwaves are similar to the properties of light waves.

Spillman, Jr. also fails to disclose wherein said element is adaptable to operate simultaneously as a sensor device and an actuator device.

In a similar field of endeavor, Schalk discloses a microstrip antenna wherein a bimorph piezoelectric element is use simultaneously as actuator and sensor (col. 3,lines 25-27)

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Spillman, Jr. to include a microstrip antenna wherein a bimorph piezoelectric element is use simultaneously as actuator and sensor for the purpose of detecting a signal and controlling a physical thing as taught in Schalk.

Spillman, Jr.further fails to disclose wherein the antenna is a microstrip antenna and wherein said element includes a grating layer.

In a similar field of endeavor, Pett discloses wherein the antenna is a microstrip antenna and wherein said element includes a grating layer (reads on grating lobes) (col. 10,lines 36-55).

At the time of the invention it would have been obvious to one of ordinary skill in the art to have modified Spillman, Jr. to include wherein the antenna is a microstrip antenna and wherein said element includes a grating layer (reads on grating lobes) for

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the purpose of providing a uniform radiation pattern with satisfactory gain and reduced coupling (see Pett, col. 10,lines 46-55).

Regarding claim 40, Spillman, Jr. as modified by Edwards, Schalk and Pett discloses claim 37, and further discloses wherein at least one of said number of sensors and said number of actuators includes only passive electronic devices (see Spillman, Jr., col. 4,lines 12-19).

Regarding claim 41, Spillman, Jr as modified by Edwards, Schalk and Pett disclose claim 37, Spillman,Jr. further inherently discloses having a protective cover layer (structure) and a substrate having a slot and feedline (feed for antenna) (col. 2,line 15- col.3,line 11).

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy K Contee whose telephone number is 571.272.7906. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571.272.7905. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JC

05/28/05

  
J. K. CONTE  
PRIMARY EXAMINER

  
CHARLES APPIAH  
PRIMARY EXAMINER